

(19)



(11)

EP 1 607 059 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
10.09.2008 Bulletin 2008/37

(51) Int Cl.:
A61B 17/24 (2006.01) A46B 15/00 (2006.01)
A46B 9/04 (2006.01)

(21) Application number: **04078237.7**

(22) Date of filing: **29.11.2004**

(54) **Oral care implement**

Mundpflegevorrichtung

Article d'hygiène buccale

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LU MC NL PL PT RO SE SI SK TR**

(30) Priority: **18.06.2004 US 869922**

(43) Date of publication of application:
21.12.2005 Bulletin 2005/51

(60) Divisional application:
08161935.5

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EP 1 607 059 B1

Description

FIELD OF THE INVENTION

[0001] The present invention pertains to an oral care implement with a cleanser for cleaning soft tissue surfaces in the mouth.

BACKGROUND OF THE INVENTION

[0002] According to the American Dental Association, a major source of bad breath in healthy people is microbial deposits on the tongue, where a bacterial coating harbors organisms and debris that contribute to bad breath. The tongue is a haven for the growth of microorganisms since the papillary nature of the tongue surface creates a unique ecological site that provides an extremely large surface area, favoring the accumulation of oral bacteria. Anaerobic flora and bacteria residing on the tongue play an important role in the development of chronic bad breath commonly called halitosis. In general, the bacteria produce volatile sulfur compounds (VSC). If there is enough buildup of the sulfur compounds, the result can be lead bad breath or oral malodor.

[0003] GB 2 391 462 discloses a toothbrush having a head and a handle, in which the head comprises at one face a tissue engaging region. This tissue engaging region comprises flaps having a longitudinal direction extending perpendicular to the longitudinal axis of the head and handle, extending outward from a surface of said head. The flaps form broad, flat scraping blades.

[0004] WO 01/45573 discloses a toothbrush comprising a handle and a head coupled to said handle, said head comprising bristles extending from one side of the head and a tissue engaging region being provided to an opposite side of the head. In some embodiments the tissue engaging region comprises a plurality of projections for cleaning soft tissue surfaces in the mouth.

[0005] While bladed tongue scrapers have been used in the past, these scrapers are inadequate in respect to their effectiveness on the soft tissue surface of the tongue. Broad flat scraping blades are limited in their ability to reach between the papillae where the bacteria and microdebris have collected. Moreover, notwithstanding the benefits to be gained by any ability to clean the tongue, some users avoid the use of such blades because of lack of comfort on the tongue surface.

[0006] Hence, there is a need for an oral care implement with a tongue cleanser that provides effective removal of the tongue bacteria and other debris while maintaining comfort to the user.

BRIEF SUMMARY OF THE INVENTION

[0007] The invention pertains to an oral care implement with a tissue cleanser that provides improved cleaning and effective removal of bacteria and microdebris disposed on the oral tissue surfaces, according to claim 1.

[0008] In one aspect of the invention, the tissue cleanser includes a plurality of nubs for cleaning soft tissue surfaces in the mouth and particularly for cleaning between the papillae of the tongue. In a further preferred aspect of the invention, the tissue cleanser includes a plurality of conically shaped nubs.

[0009] In another aspect of the invention, the tissue cleanser is constructed from an elastomeric material. In one preferred embodiment, the tissue cleanser is formed as an elastomeric pad.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] A more complete understanding of the present invention and the advantages thereof may be acquired by referring to the following description in consideration of the accompanying drawings, in which like reference numbers indicate like features, and wherein:

Figure 1 is an exploded assembly perspective view of an oral care implement according to one or more aspects of an illustrative embodiment;

Figure 2 is an enlarged perspective view of a head of an oral care implement of FIG. 1;

Figure 3 is a plan view of the oral care implement of FIG. 1 illustrating a tongue cleaning feature;

Figure 4 is a partial section view of a head of the oral care implement of FIG. 1 taken along line 4-4 of FIG. 3;

Figure 5 is a plan view of the oral care implement of FIG. 1 illustrating at least one tooth cleaning configuration;

Figure 6 is a perspective of the view of the oral care implement illustrating example tooth cleaning elements; and

Figure 7 is a section view of an alternative construction of the head of an oral care implement.

DETAILED DESCRIPTION OF THE INVENTION

[0011] In the following description, the invention is discussed in terms of a toothbrush, but could be in the form of other oral care implements including simply a tissue cleansing implement. Further, it is to be understood that other embodiments may be utilized and structural and functional modifications may be made without departing from the scope of the present invention.

[0012] Figures 1-7 illustrate an oral care implement, such as a toothbrush 100, having a handle 103 and a head 105 which may be used for cleaning the teeth and soft tissue in the mouth, such as the tongue, interior surfaces of the cheeks, lips or the gums. Handle 103 is provided for the user to readily grip and manipulate the toothbrush, and may be formed of many different shapes and constructions. While the head is normally widened relative to the neck of the handle, it could in some constructions simply be a continuous extension or narrowing of the handle. In the preferred construction, head 105 has

a first face 106 that supports tooth cleaning elements 107 (FIGS. 5 and 6) and a second face 108 that supports a tissue cleanser 300 (FIGS. 2 and 3). The first and second faces 106, 108 are preferably on opposite sides of head 105. Nevertheless, tissue cleanser 300 may be mounted elsewhere, such as the proximal end 104 of handle 103. The tissue cleanser 300 or portions of it may also be located on the peripheral sidewall surface 101 of head 105 or extend farther towards the proximate end 104 of handle 103 than illustrated.

[0013] The elastomeric material of tissue cleanser 300 may be any biocompatible resilient material suitable for uses in an oral hygiene apparatus. To provide optimum comfort as well as cleaning benefits, the elastomeric material preferably has a hardness property in the range of A8 to A25 Shore hardness. As an example, one preferred elastomeric material is styrene-ethylene/butylene-styrene block copolymer (SEBS) manufactured by GLS Corporation. Nevertheless, SEBS material from other manufacturers or other materials within and outside the noted hardness range could be used.

[0014] Tissue cleanser 300 is preferably configured with a multiplicity of tissue engaging elements 303 (FIGS. 1-4), which in the preferred construction are formed as nubs. As used herein a "nub" is generally meant to include a column-like protrusion (without limitation to the cross-sectional shape of the protrusion) which is up-standing from a base surface. In a general sense, the nub, in the preferred construction, has a height that is greater than the width at the base of the nub (as measured in the longest direction). Nevertheless, nubs could include projections wherein the widths and heights are roughly the same or wherein the heights are somewhat smaller than the base widths. Moreover, in some circumstances (e.g., where the nub tapers to a tip or includes a base portion that narrows to a smaller projection), the base width can be substantially larger than the height.

[0015] Such tissue engaging elements 303 are designed to significantly reduce a major source of bad breath in people and improve hygiene. Nubs 303 enable removal of microflora and other debris from the tongue and other soft tissue surfaces within the mouth. The tongue, in particular, is prone to develop bacterial coatings that are known to harbor organisms and debris that can contribute to bad breath. This microflora can be found in the recesses between the papillae on most of the tongue's upper surface as well as along other soft tissue surfaces in the mouth. When engaged or otherwise pulled against a tongue surface, for example, nubs 303 of elastomeric tissue cleanser 300 provide for gentle engagement with the soft tissue while reaching downward into the recesses of adjacent papillae of the tongue. The elastomeric construction of tissue cleanser 300 also enables the base surface 301 to follow the natural contours of the oral tissue surfaces, such as the tongue, cheeks, lips, and gums of a user. Moreover, the soft nubs 303 are able to flex as needed to traverse and clean the soft tissue surfaces in the mouth along which it is moved.

[0016] As seen in Figure 2 and 4, in one preferred arrangement of tissue cleanser 300, nubs 303 are preferably conically shaped. As used herein, "conically shaped" or "conical" is meant to include true cones, frusto-conically shaped elements, and other shapes that taper to a narrow end and thereby resemble a cone irrespective of whether they are uniform, continuous in their taper, or have rounded cross-sections. With reference to Figure 4, the base portion 305 of each conically shaped tissue engaging element 303 is larger than the corresponding tip portion 307. In this conically shaped configuration, the base portion 305 has a wider cross-sectional area to provide effective shear strength to withstand the lateral movement of the tissue cleanser 300 along the surface of the tongue or other soft tissue surface. The smaller width or diameter of the tip portion 307 in conjunction with the length of the conically shaped nub 303 enable the nubs to sweep into the recesses of the tongue and other surfaces to clean the microbial deposits and other debris from the soft tissue surfaces. In the preferred construction, nubs 303 are able to flex and bend from their respective vertical axes as lateral pressure is applied during use. This flexing enhances the comfort and cleaning of the soft tissue surfaces. In a preferred construction, the thickness or width of the base of the nub is 0.64 mm, and preferably within the range from about 0.51 mm to about 2.00 mm. Tip 307 of the nubs is 0.127 mm and preferably within a range from about 0.10 mm to about 0.75 mm for optimal penetration between the recesses of papillae of a user's tongue. The length or height of nubs 303, as measured from base surface 301 to tip 307, is preferably 0.91 mm and preferably within range from about 0.5 mm to about 2.5 mm, and most preferably range between 0.75 mm to 1.5 mm. Nevertheless, nubs of other sizes and shapes outside the given ranges can be used.

[0017] In a preferred construction, nubs 303 are disposed on the base surface 301 of tissue cleanser 300 in a high density pattern. Each nub 303 is preferably spaced apart from adjacent nubs 303 between a range of about 0.5 mm to about 3 mm; more preferably the spacing ranges between 0.7 mm to 2.5 mm, and most preferably between 1 mm to 2 mm. Nevertheless, other spacing ranges are possible. The surface density of the nubs 303 on base surface 301 ranges preferably from about 0.155 - 0.930 nubs per square mm (= 100 to about 600 nubs per square inch). In a more preferred construction of the tissue cleanser, the surface density may range from 0.310 - 0.775 nubs per square mm (= 200 to 500 nubs per square inch), and most preferably between 0.465 - 0.695 nubs per square mm (= 300 to 450 nubs per square inch). In one preferred example, tissue cleanser 300 includes about 0.620 nubs per square mm (= 400 nubs per square inch) of surface area. The surface density features in conjunction with the height of the nubs 303 enables the tissue cleanser to provide enhanced cleaning of the soft tissue surfaces with improved comfort. Nonetheless, other surface densities are possible.

[0018] As seen in Figure 3, nubs 303 are preferably disposed in longitudinal rows in a direction generally parallel to the longitudinal axis a-a. Further, nubs 303 are disposed in transverse rows R1, R2 on an axis parallel to base surface 301 and generally perpendicular to the longitudinal axis a-a. In one preferred construction, adjacent nubs 303 are provided on the base surface 301 in a staggered arrangement. For example, adjacent transverse rows of nubs R1 and R2 have nubs 303 that are not directly behind each other. A first nub is said herein to be "directly behind" second nub when it is located within the lateral bounds of the second nub extending in a longitudinal direction. This configuration enables improved cleaning of the soft tissue surfaces by facilitating the removal of microflora and other debris, and especially from the recesses of adjacent papillae of the tongue. Nonetheless, the nubs could be arranged randomly or in a myriad of different patterns.

[0019] Tongue cleanser 300 is preferably formed by being molded to head 105, although other manufacturing processes could be used. With reference to Figures 1 and 4, tissue cleanser 300 is preferably molded within a basin or a receiving cavity 111 in face 108 of head 105. The receiving cavity 111 has a lower base surface 113 and a peripheral sidewall 115 extending away from the lower base surface 113. In one mounting arrangement, nubs 303 of the tissue cleanser 300 are exposed for use with the base surface of the tissue cleanser 300 being flush or recessed relative to the surface 114 of the head. Nevertheless, other orientations are possible. Also, base surface 301 of the tissue cleanser could be embedded in head 105 or covered by another layer with nubs 303 projecting through appropriate openings.

[0020] As can be seen in Figures 1 and 4, face 108 includes one or more protuberances 117a-c disposed within basin 111. Protuberances 117 form anchor points against the opposing mold to prevent the head from moving under the pressure of the injection molding. As a result, tissue cleanser 300 includes one or more complementary apertures 311a-c which exposes the tops of protuberances 117a-c. Although, the pegs are illustrated in alignment along the centerline of the head (e.g. longitudinal axis a-a), the pegs could have many different positions.

[0021] Alternatively, basin 111 and protuberances 117a-c may be provided to position and hold a previously molded tissue cleanser, although these constructions are not necessary to use such a previously molded tissue cleanser.

[0022] Protuberances 117a-c may take on a variety of shapes and lengths. With continued reference to the Figures 1 and 4, head 105 includes protuberances 117a-c extending away from the lower base surface 113 of basin 111 to the height of the peripheral sidewall 115. The protuberances 117a-c are shaped in the form of a cylinder, but other shapes and lengths of the protuberances 117a-c are possible. While the molding process would preferably bond the tissue cleanser to the head, the tissue

cleanser could be performed and attached by adhesive or other known means.

[0023] As shown in Figures 1-4, tissue cleanser 300 is preferably formed as a pad composed of a soft and pliable elastomeric material for comfortable cleaning and effective removal of bacteria and debris disposed on the surface of the tongue, other soft tissue in the mouth and even along the lips. The tissue cleanser 300 also provides effective massaging, stimulation and removal of bacteria, debris and epithelial cells from the surfaces of the tongue, cheeks, gums or lips.

[0024] In the preferred construction (FIGS. 1-6), tissue cleansers 300 may rub against the inside surfaces of the cheeks or lips, and on the sides of the tongue while the user brushes his or her teeth, and thus provide a desired massaging, stimulation and cleaning of various soft tissue surfaces within the mouth. For example, during brushing of the facial tooth surfaces, tissue cleanser 300 is disposed on the outer face 108 of head 105 to naturally rub against the oral surfaces of the cheek. As a result, enhanced cleaning is attained without additional cleaning steps. Further, some users may sense a stimulating tingle on the cheek surfaces that leads to a positive user reaction, and even enjoyment of the comfortable feel of the tissue cleanser along the soft tissues surfaces in the mouth. Tissue cleanser 300 may also be additionally rubbed on the cheeks, tongue, etc. as desired for further cleaning aside from the contact that may occur while brushing the teeth.

[0025] Referring to Figures 5 and 6, the tooth cleaning elements 107 of head 105 may include a variety of tooth cleaning elements which can be used for wiping, cleaning and massaging the user's teeth and gums. Any suitable form of tooth cleaning elements may be used. The term "tooth cleaning elements" is used in a generic sense which refers to filament bristles or elastomeric fingers or walls that have any desirable shape. In the illustrated example of Figure 5, tooth cleaning elements 107 include distal tooth cleaning elements 203a-b disposed at a distal tip 121 of head 105, peripheral tooth cleaning elements 205a-1, longitudinal tooth cleaning elements 207a-c disposed along longitudinal axis a-a, arcuate tooth cleaning elements 209a-d and 211a-b, and proximal cleaning elements 213a,b. Tooth cleaning elements 205, 207, 211 and 213 are preferably provided as tufts of bristles whereas tooth cleaning elements 209 are preferably formed as elastomeric walls. Nevertheless, other forms and types of tooth cleaning elements may be used.

[0026] Figure 7 illustrates a sectional view of an alternative arrangement of a head 400 of a toothbrush. Head 400 is similar in construction to head 105, except that tooth cleaning elements 209a-d are integrally formed with tissue cleanser 300. To accomplish the alternative construction, head 400 has appropriately sized ports or openings 401 to allow the elastomeric material to flow through the head during an injection molding process. In this construction, tooth cleaning elements 209a-d and tissue cleaner 300 are formed with the same elastomeric

material. Thus, head 400 may include at least one elastomeric tooth cleaning element formed as a unitary member with tissue cleanser 300.

[0027] As various changes could be made in the above methods, compositions and structures without departing from the scope of the invention, it is intended that all matter contained in this application, including all mechanisms and/or modes of interaction described above, shall be interpreted as illustrative only and not limiting in any way the scope of the appended claims.

[0028] The following examples are set forth as representative of the improved operation of the present invention. These examples are not to be construed as limiting the scope of the invention.

EXAMPLE 1

[0029] The performance nature of a toothbrush can be measured using known oral malodor assessment methods. A study was conducted to evaluate the performance of a toothbrush provided with an elastomeric tissue cleanser having conically shaped nubs, such as the preferred construction of toothbrush 100 discussed above. Human test subjects participated in the study. There was a washout or normalization period prior to testing of about 7 days in which the test subjects brushed twice a day with a fluoride dental cream (see Table 1). After the washout period, the test subjects were asked to refrain from any oral hygiene (brushing, rinsing, and flossing), eating and drinking prior to oral testing. A baseline volatile sulfur compound (VSC) sample was taken from each of the test subjects. In the study for overnight odor control, the test subjects brushed their teeth for one minute with a fluoride dental cream (see Table 1) using toothbrush 100 provided with the above noted tissue cleanser 300. Subsequently, the subjects cleaned their tongue surface with the tissue engaging elements of the toothbrush for ten seconds. The test subjects slept overnight and returned for post treatment. VSC samples were taken at the ten-hour time point from the previous day cleaning. In the illustrative example, use of the toothbrush reduced oral VSC about 60% verses brushing the teeth alone as measured from a baseline ten hours after use. The VSC readings were obtained by gas chromatography.

EXAMPLE 2

[0030] In another study of the above-noted toothbrush 100, there was a washout or normalization period prior to testing of about 7 days which the test subjects brushed twice a day with a fluoride dental cream (see Table 1). The test subjects were asked to refrain from any oral hygiene (brushing, rinsing, and flossing), eating and drinking before testing. After the washout period, the test subjects provided a baseline tongue bacteria sample by swabbing a side of the back of the tongue with a sterile cotton swab. The test subjects brushed their teeth with a fluoride dental cream (see Table 1) for one minute with

the toothbrush having the above-noted tissue cleanser. Subsequently, the test subjects cleaned their tongue surface with a preferred construction of the tissue engaging elements 300 of the toothbrush 100 for ten seconds. Two hours after the cleaning of the tongue surface, a tongue bacteria sample was taken from a side of the back of the tongue with a cotton swab. In the illustrative example, use of the tissue engaging elements controlled more odor causing tongue bacteria than simply brushing the teeth alone. Use of the tissue cleanser 300 demonstrated a tongue bacteria log reduction of over 0.8 Log colony forming units/ml two hours after use on the tongue.

EXAMPLE 3

[0031] In another study of the above-noted toothbrush, a MTT assay was used to examine the viability of the epithelial cells collected from the oral cavity prior to and after the use of the toothbrush with the noted tissue cleanser. The MTT Assay was based on the enzymatic reduction of the tetrazolium salt MTT [3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-tetrazoliumbromide ++ +] in living, metabolically active cells. The reaction was carried out *in situ* in test tubes, and the reaction product, a purple-colored formazan soluble in dimethylsulfoxide, was measured colorimetrically using a multiwell plate reader. Advantageously, the MTT Assay offers a high degree of precision, ease of use, and suitability for the purpose for large scale chemosensitivity testing.

[0032] Following a 7-day washout period, the test subjects reported to a test site without prior eating, drinking, or performing oral hygiene. The test subjects provided salivary rinse samples by rinsing their oral cavity with 9 ml of sterile water for 10 seconds and then discharging the water from the rinse into a tube containing 10x sterile phosphate buffered saline (PBS) solution. The samples were refrigerated for approximately 30 minutes before the MTT Assay was run. The test subjects brushed their teeth under supervision for one minute using a fluoride dental cream (see Table 1) followed by 10 seconds of tongue cleaning with the tongue cleanser 300 of the preferred construction. Approximately 30 minutes after brushing and tongue cleaning, the test subjects provided a rinse sample in the manner described previously.

[0033] The pre-rinse samples and post-rinse samples were centrifuged for 15 minutes at about 3000 RPM. The supernatant, e.g., clear liquid, was removed and the pellet was resuspended in 2.5 mL of PBS. The samples were vortexed for 5 seconds, then 2.5 ml of MTT Solution was added. The samples were subsequently incubated in a gently shaking waterbath set at 37 °C for 2 hours. Following the 2 hour incubation period, the samples were centrifuged for 15 minutes at about 3000 RPM. The supernatant was siphoned out and 3 mL of detergent (0.04 N Acid Isopropanol) was added to dissolve purple crystals. An increase or decrease in MTT conversion was spectrophotometrically quantified. From each sample, 200 µl of each was added to 96 well plates and the optical

density was measured at 570 nm and compared to a negative buffer control. In the illustrative example, one minute of brushing followed by 10 seconds of use of the tissue cleanser reduced oral epithelial cells about 72% as determined by a MTT assay protocol.

EXAMPLE 4

[0034] In another study, human test subjects provided baseline VSC samples via a Halimeter™ (i.e., a sulfide meter). A Halimeter™ uses an electrochemical, voltametric sensor which generates a signal when it is exposed to VSC such as, sulfide and mercaptan gases and measures the concentration of hydrogen sulfide gas in parts per billion. The test subjects brushed their teeth under supervision for one minute with the preferred construction of a toothbrush having the above noted tissue cleanser. Then, the test subjects used the noted toothbrush to provide six strokes on the tongue surface. A subsequent VSC sample was taken from the test subjects two hours after the brushing stage. In this illustrative example, use of a toothbrush with the tissue cleanser reduced the measured VSC in the mouth odor over 35% from a baseline measured two hours after use.

EXAMPLE 5

[0035] In one other study, after a washout period, human test subjects rinsed their mouths with sterile water to provide a baseline sample for viable epithelial cell analysis with the MTT assay. The subjects brushed their teeth under supervision for one minute with the preferred construction of the toothbrush having the above-noted tissue cleanser. Then, the test subjects used the tissue cleanser to provide six strokes on the tongue surface. The test subjects provided a post rinse sample for analysis. The samples were tested and analyzed in the manner as discussed with respect to Example 3. In this example, use of the toothbrush reduced oral epithelial cells by about 92% from a baseline as determined by MTT assay protocol.

[0036] In the above noted examples, the subjects brushed their teeth using a fluoride dental cream with the formulation in Table 1.

Table 1

% wt.	Ingredient
48.76%	Dicalcium Phosphate Dihydrate
22.0063%	Water
22.00%	Glycerin
4.138%	SO3 Sodium Lauryl Sulfate base - 29%
1.000%	Sodium CMC - 7MF - Food Grade

(continued)

% wt.	Ingredient
0.89%	105 Dental Cream Flavor
.76%	Sodium Monofluorophosphate
.25%	Tetrasodium Pyrophosphate
.20%	Sodium Saccharin

Claims

1. An oral care implement (100) comprising:

- a handle (103);
- a head (105; 400) coupled to the handle (103);
- tooth cleaning elements (107; 207) extending from one side of the head; and
- a tissue engaging region provided to an opposite side of the head (105; 400) and/or to the handle (103), said tissue engaging region comprising a plurality of projections (303) for cleaning soft tissue surfaces in the mouth,

characterised in that the tissue engaging region comprises a tissue cleanser (300) provided with said projections (303), wherein a plurality of protuberances (117) extends from the oral implement (100), the protuberances each having a free end and said tissue cleanser (300) having a plurality of apertures (311) exposing free ends of the protuberances (117).

2. The oral care implement (100) according to claim 1, wherein the tooth cleaning elements (107; 207) include a first group of arcuate tooth cleaning elements and a second group of arcuate tooth cleaning elements.

3. The oral care implement according to claim 2, wherein the first group and the second group of arcuate tooth cleaning elements (107; 207) comprise an elastomeric material and the tissue cleanser has a hardness of about 8-25 Shore A.

4. The oral care implement according to any one of claims 1 - 3, in which the projections (303) include a plurality of nubs.

5. The oral care implement according to claim 4, in which the nubs (303) are conically shaped

6. The oral care implement according to any one of claims 1-5, wherein the head (105; 400) includes a basin (111), and the protuberances (117) and the

tissue cleanser (300) are positioned within the basin (111).

7. The oral care implement according to any one of claims 1 - 5, wherein the head (105; 400) having a basin (111) formed in one side thereof; the basin (111) having a base surface (113) and a peripheral sidewall (115) extending from the base surface (113), the sidewall (115) having an exposed top surface, and the basin (111) including the plurality of protuberances (117) extending from the base surface (113), wherein protuberances (117) have a top portion raised above the base surface (113); and said tissue cleanser (300) made of an elastomeric material received in the basin (111), the tissue cleanser (300) having a top surface being generally flush with the top surface of the sidewall (115), the tissue cleanser (300) having complementary openings (311) for receiving the protuberances (117) therein and exposing the top portions thereof. 5 10 15 20
8. The oral care implement according to any one of claims 1 - 7, in which the projections, preferably nubs (303) are disposed in longitudinal rows and transverse rows on the surface area of the tissue cleanser (300). 25
9. The oral care implement according to any one of claims 1 - 8, in which adjacent transverse rows of nubs (303) are in a staggered relationship. 30
10. The oral care implement according to any one of claims 1 - 9, wherein the tissue cleanser has a nub density of about 0,155 - 0,930 nubs per square mm (150 - 600 nubs per square inch). 35
11. The oral care implement according to any one of claims 1 - 10, wherein the tissue cleanser has a nub density of about 0,310 - 0,775 nubs per square mm (200 - 500 nubs per square inch). 40
12. The oral care implement according to claim 2, wherein at least one group of the arcuate segment tooth cleaning elements (107; 207) comprises at least one bristle tuft. 45
13. The oral care implement according to claim 2, wherein at least one group of the arcuate tooth cleaning elements (107; 207) comprises at least one elastomeric member. 50
14. The oral care implement according to claim 2, wherein the groups of arcuate segment tooth cleaning elements (107; 207) comprise elastomeric walls and a bristle tuft is disposed within each of the groups of arcuate cleaning elements (107; 207). 55

Patentansprüche

1. Mundpflegevorrichtung (100) mit:

- einem Griff (103),
- einem Kopf (105; 400), der mit dem Griff (103) verbunden ist,
- Zahnreinigungselementen (107; 207), die sich von einer Seite des Kopfes erstrecken, und
- einem Gewebeangriffsbereich, der an einer gegenüberliegenden Seite des Kopfes (105; 400) und/oder an dem Griff (103) vorgesehen ist, wobei der Gewebeangriffsbereich eine Vielzahl von Vorsprüngen (303) zum Reinigen von Weichgewebeflächen im Mund aufweist,

dadurch gekennzeichnet, dass der Gewebeangriffsbereich eine Gewebereinigungseinrichtung (300) aufweist, die mit den Vorsprüngen (303) versehen ist, wobei sich eine Vielzahl von Erhebungen (117) von der Mundvorrichtung (100) erstreckt und wobei die Erhebungen jeweils ein freies Ende haben und die Gewebereinigungseinrichtung (300) eine Vielzahl von Öffnungen (311) aufweist, die freie Enden der Erhebungen (117) freilegen.

2. Mundpflegevorrichtung (100) nach Anspruch 1, bei der die Zahnreinigungselemente (107; 207) eine erste Gruppe von bogenförmigen Zahnreinigungselementen und eine zweite Gruppe von bogenförmigen Zahnreinigungselementen aufweisen.

3. Mundpflegevorrichtung (100) nach Anspruch 2, bei der die erste Gruppe und die zweite Gruppe von bogenförmigen Zahnreinigungselementen (107; 207) ein elastomeres Material aufweisen und die Gewebereinigungseinrichtung eine Härte von ungefähr 8 bis 25 Shore A hat.

4. Mundpflegevorrichtung nach einem der Ansprüche 1 bis 3, bei der die Vorsprünge (303) eine Vielzahl von Noppen umfassen.

5. Mundpflegevorrichtung nach Anspruch 4, bei der die Noppen (303) konisch geformt sind.

6. Mundpflegevorrichtung nach einem der Ansprüche 1 bis 5, bei der der Kopf (105; 400) eine Vertiefung (111) aufweist und die Erhebungen (117) und die Gewebereinigungseinrichtung (300) in der Vertiefung (111) angeordnet sind.

7. Mundpflegevorrichtung nach einem der Ansprüche 1 bis 5, bei der der Kopf (105; 400) eine Vertiefung (111) aufweist, die in einer Seite von ihm ausgebildet ist und die eine Basisfläche (113) und eine äußere, sich von der Basisfläche (113) erstreckende Seitenwand (115) aufweist, wobei die Seitenwand (115)

eine frei liegende obere Oberfläche hat und die Vertiefung (111) die Vielzahl von Erhebungen (117), die sich von der Basisfläche (113) erstrecken, wobei Erhebungen (117) einen oberen Bereich haben, der sich über die Basisfläche (113) erhebt, und die Gewebereinigungseinrichtung (300) enthält, die aus einem elastomeren Material hergestellt ist, das in der Vertiefung (111) aufgenommen ist, wobei die Gewebereinigungseinrichtung (300) eine obere Oberfläche aufweist, die im Wesentlichen bündig mit der oberen Oberfläche der Seitenwand (115) ist und die Gewebereinigungseinrichtung (300) komplementäre Öffnungen (311) zur Aufnahme der Erhebungen (117) in diesen und zum Freilegen von deren oberen Bereichen hat.

8. Mundpflegevorrichtung nach einem der Ansprüche 1 bis 7, bei der die Vorsprünge, bevorzugt Noppen (303), in Längsreihen und Querreihen an dem Oberflächenbereich der Gewebereinigungseinrichtung (300) angeordnet sind.
9. Mundpflegevorrichtung nach einem der Ansprüche 1 bis 8, bei der sich benachbarte Querreihen von Noppen (303) in einer gegeneinander versetzten Beziehung befinden.
10. Mundpflegevorrichtung nach einem der Ansprüche 1 bis 9, bei der die Gewebereinigungseinrichtung eine Noppendichte von ungefähr 0,155 bis 0,930 Noppen pro Quadratmillimeter (150 bis 600 Noppen pro Quadratinch) aufweist.
11. Mundpflegevorrichtung nach einem der Ansprüche 1 bis 10, bei der die Gewebereinigungseinrichtung eine Noppendichte von ungefähr 0,310 bis 0,775 Noppen pro Quadratmillimeter (200 bis 500 Noppen pro Quadratinch) aufweist.
12. Mundpflegevorrichtung nach Anspruch 2, bei der mindestens eine Gruppe der Bogensegment-Zahnreinigungselemente (107; 207) mindestens ein Borstenbüschel aufweist.
13. Mundpflegevorrichtung nach Anspruch 2, bei der mindestens eine Gruppe der bogenförmigen Zahnreinigungselemente (107; 207) mindestens eine elastomere Komponente aufweist.
14. Mundpflegevorrichtung nach Anspruch 2, bei der die Gruppen von Bogensegment-Zahnreinigungselementen (107; 207) elastomere Wände aufweisen und ein Borstenbüschel innerhalb jeder der Gruppen bogenförmiger Reinigungselemente (107; 207) angeordnet ist.

Revendications

1. Article d'hygiène buccale (100) comprenant :

- un manche (103) ;
- une tête (105 ; 400) couplée au manche (103) ;
- des éléments de nettoyage de dents (107 ; 207) s'étendant d'un côté de la tête ; et
- une région d'engagement de tissus aménagée sur un côté opposé de la tête (105 ; 400) et/ou sur le manche (103), ladite région d'engagement de tissus comprenant une pluralité de saillies (303) pour nettoyer les surfaces de tissus mous de la bouche,

caractérisé en ce que la région d'engagement de tissus comprend un élément nettoyant de tissus (300) muni desdites saillies (303), dans lequel une pluralité de protubérances (117) s'étend de l'article d'hygiène buccale (100), les protubérances ayant chacune une extrémité libre et ledit élément nettoyant de tissus (300) ayant une pluralité d'ouvertures (311) exposant les extrémités libres des protubérances (117).

2. Article d'hygiène buccale (100) selon la revendication 1, dans lequel les éléments de nettoyage de dents (107 ; 207) comprennent un premier groupe d'éléments de nettoyage de dents incurvés et un second groupe d'éléments de nettoyage de dents incurvés.
3. Article d'hygiène buccale selon la revendication 2, dans lequel les premier et second groupes d'éléments de nettoyage de dents incurvés (107 ; 207) comprennent un matériau élastomère et l'élément nettoyant de tissus présente une dureté Shore A d'environ 8 à 25.
4. Article d'hygiène buccale selon l'une quelconque des revendications 1 à 3, dans lequel les saillies (303) comprennent une pluralité de noppes.
5. Article d'hygiène buccale selon la revendication 4, dans lequel les noppes (303) présentent une forme conique.
6. Article d'hygiène buccale selon l'une quelconque des revendications 1 à 5, dans lequel la tête (105 ; 400) comprend une cuvette (111) et les protubérances (117) et l'élément nettoyant de tissus (300) sont placés à l'intérieur de la cuvette (111).
7. Article d'hygiène buccale selon l'une quelconque des revendications 1 à 5, dans lequel la tête (105 ; 400) a une cuvette (111) aménagée sur un de ses côtés; la cuvette (111) a une surface de base (113) et une paroi latérale périphérique (115) qui s'étend

de la surface de base (113), la paroi latérale (115) a une surface supérieure exposée et la cuvette (111) comprend la pluralité de protubérances (117) qui s'étendent de la surface de base (113), dans lequel les protubérances (117) ont une partie supérieure relevée au-dessus de la surface de base (113); et ledit élément nettoyant de tissus (300) est formé d'un matériau élastomère reçu dans la cuvette (111), l'élément nettoyant de tissus (300) ayant une surface supérieure qui est généralement à fleur avec la surface supérieure de la paroi latérale (115), l'élément nettoyant de tissus (300) ayant des ouvertures complémentaires (311) pour recevoir les protubérances (117) à l'intérieur et exposer leurs parties supérieures.

8. Article d'hygiène buccale selon l'une quelconque des revendications 1 à 7, dans lequel les saillies, de préférence des noppes (303), sont disposées en rangées longitudinales et en rangées transversales sur la surface de l'élément nettoyant de tissus (300). 5
9. Article d'hygiène buccale selon l'une quelconque des revendications 1 à 8, dans lequel les rangées adjacentes de noppes (303) présentent une disposition en quinconce. 10
10. Article d'hygiène buccale selon l'une quelconque des revendications 1 à 9, dans lequel l'élément nettoyant de tissus a une densité de noppes d'environ 0,155 à 0,930 noppe par mm² (150 à 600 noppes par pouce carré). 15
11. Article d'hygiène buccale selon l'une quelconque des revendications 1 à 10, dans lequel l'élément nettoyant de tissus a une densité de noppes d'environ 0,310 à 0,775 noppe par mm² (200 à 500 noppes par pouce carré). 20
12. Article d'hygiène buccale selon la revendication 2, dans lequel au moins un groupe des éléments de nettoyage de dents à segments incurvés (107 ; 207) comprend au moins une touffe de soies. 25
13. Article d'hygiène buccale selon la revendication 2, dans lequel au moins un groupe des éléments de nettoyage de dents incurvés (107; 207) comprend au moins un élément élastomère. 30
14. Article d'hygiène buccale selon la revendication 2, dans lequel les groupes d'éléments de nettoyage de dents à segments incurvés (107; 207) comprennent des parois élastomères et une touffe de soies est disposée à l'intérieur de chacun des groupes d'éléments de nettoyage incurvés (107 ; 207). 35

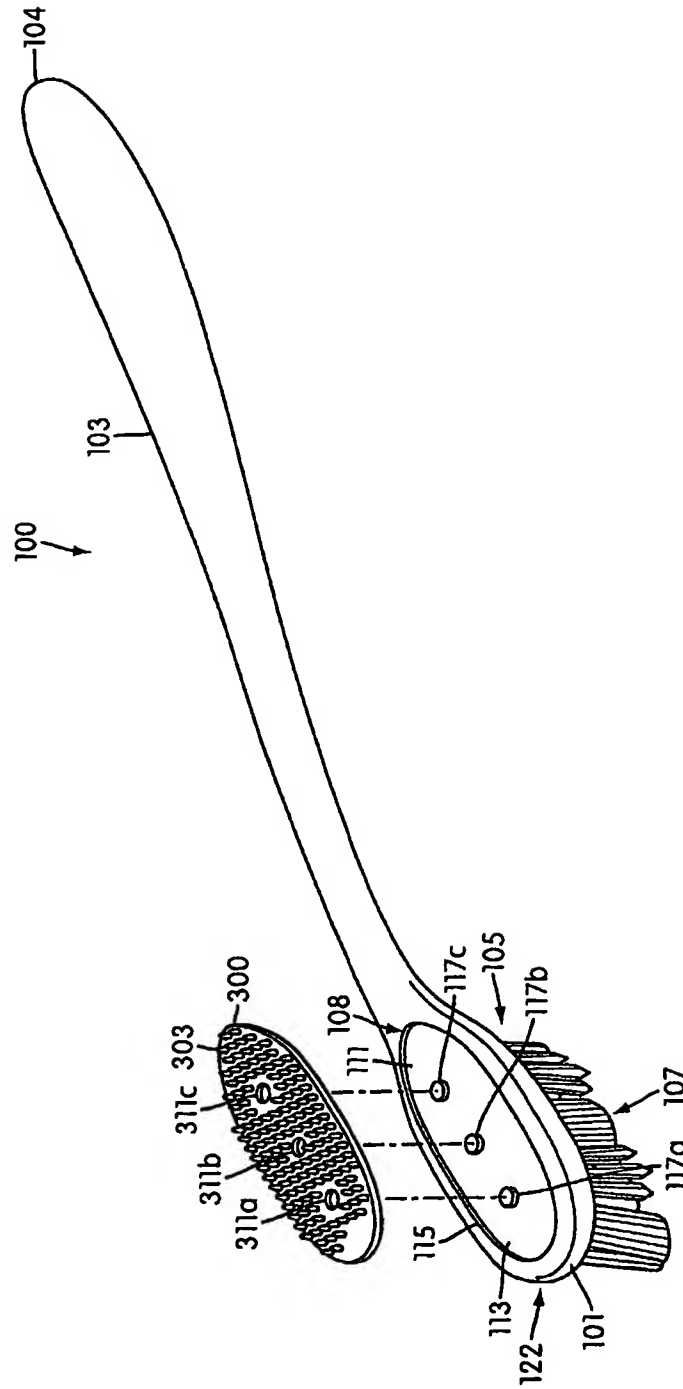


FIG. 1

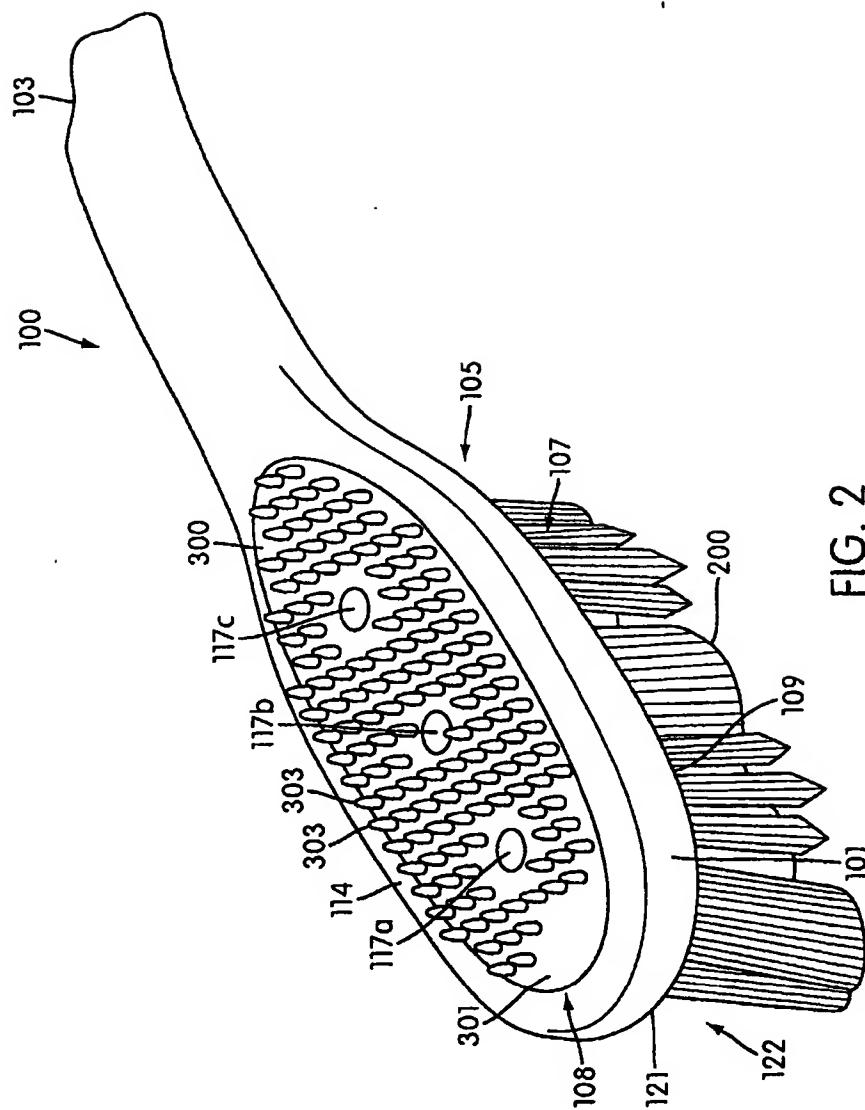
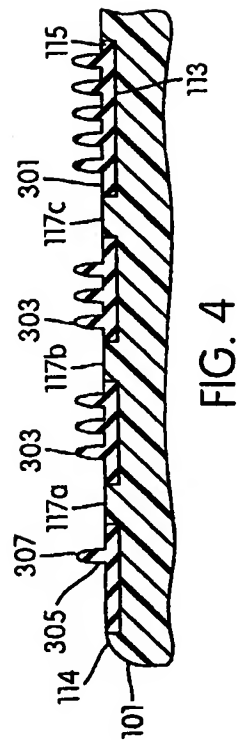
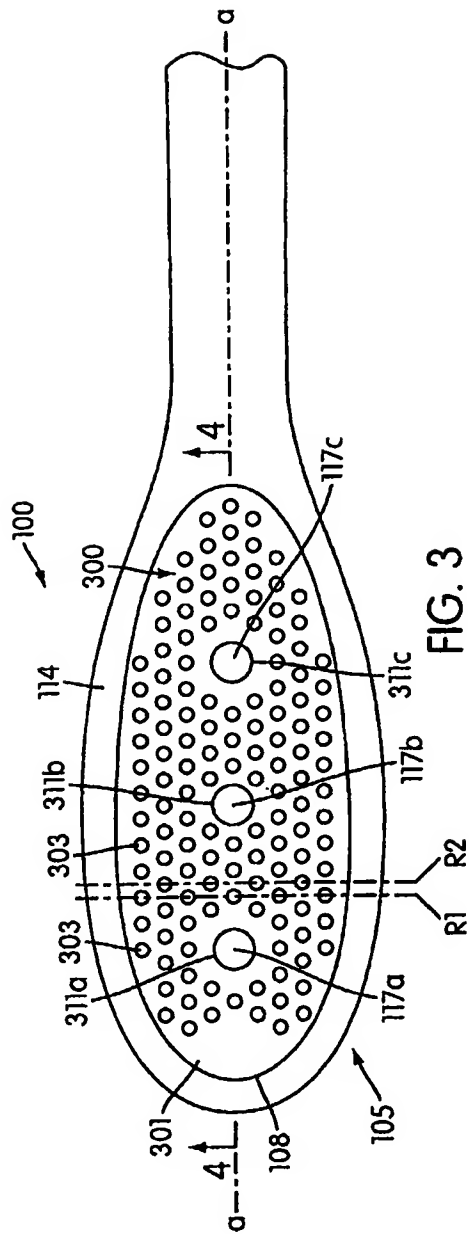


FIG. 2



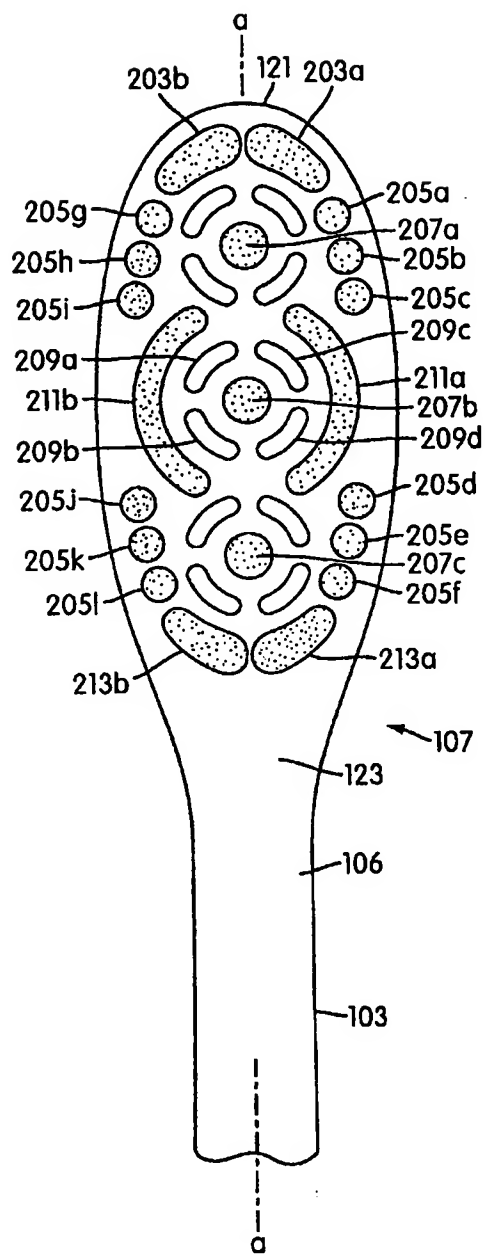
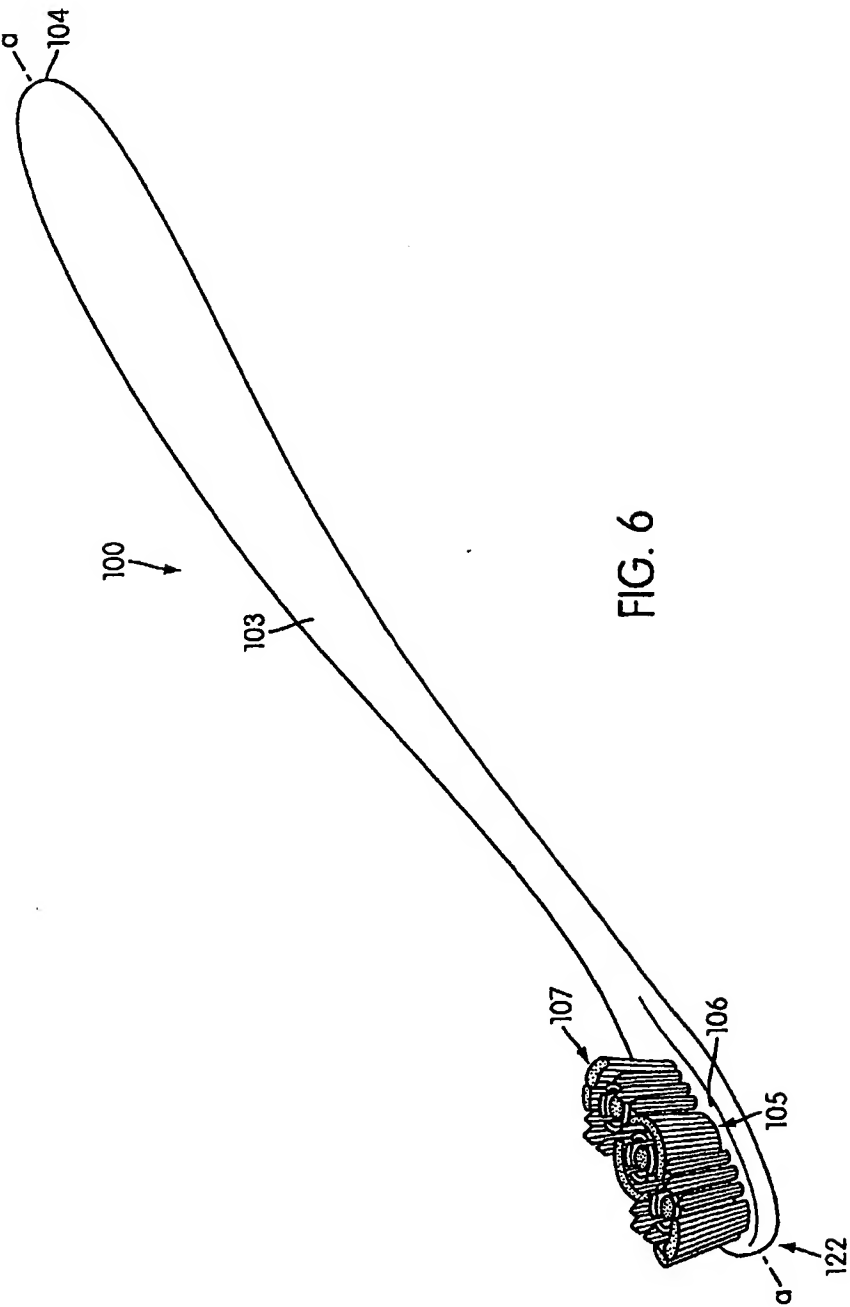


FIG. 5



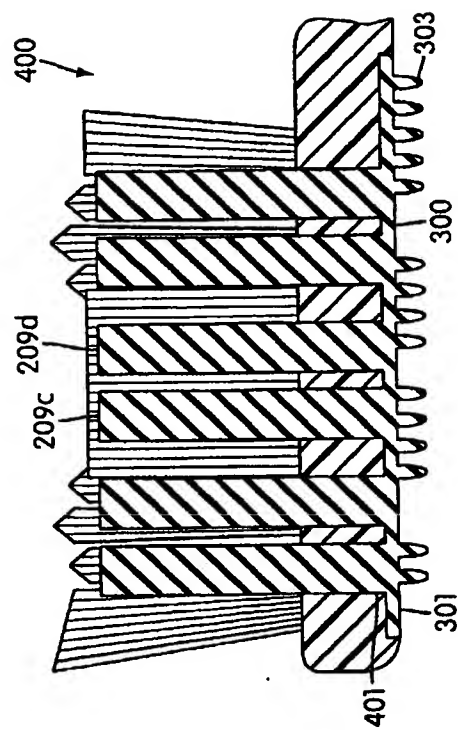


FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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